CHAPTER 5

On Semantics and the Binding Theory

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1 Introduction

This article concerns natural language applications of a formal semantic theory called *Semantic Case Theory* (SCT) (Keenan 1987a).

Section 2 formally defines the semantic cases (*nominative* and *accusative*) needed to interpret transitive Ss and shows how our pretheoretical notions of 'logical subject (object)' and 'quantifier scope' may be characterized in these terms.

Section 3 presents the axioms of SCT and empirically investigates ways in which languages syntactically and morphologically present their nominatively and accusatively interpreted NPs. I demonstrate here the existence of *VP-nominative* languages – ones whose transitive Ss present a hierarchical structure like English [NP[V NP]] but in which, in distinction to English, the VP internal NP is interpreted nominatively rather than accusatively.

Section 4 extends the class of NP interpretations with a language independent (semantic) definition of *anaphor* and initiates a theory of anaphora based on that definition. The definition may be taken as an explication of our pretheoretical notion of 'referentially dependent' (Chomsky 1986: 93, 144). The theory of anaphora developed here is contrasted with that of the Binding Theory as presented in Chomsky (1986).[1]

2 Semantic Case Theory

2.1 *NPs with intransitive predicates*

We shall first consider how NPs are semantically interpreted when they combine with simple intransitive predicates (P_1s) to form main clause sentences (Ss). Then I introduce *semantic cases* as ways of *extending* these NP interpretations to their occurrences in transitive contexts.

Semantically we shall think of (main clause) Ss as (interpreted as) True

or False in a given situation. A situation is in part specified by giving a domain D of (possibly mental) objects which we think of ourselves as speaking about. Given a situation, a simple P_1 such as *sings* determines a subset SING of D, those objects with the property of singing (in that situation). Such subsets of D will be called *properties* and P_1s will be interpreted as (= denote) properties.

NPs which combine with simple P_1s to form Ss will be called *initial*. Consider the interpretation of the initial NPs in (1).

(1) a. Some teacher is asleep
    b. Every student laughed.

(1b) is True (in a situation) just in case each object with the STUDENT property is also one with the LAUGH property, that is, STUDENT is a subset of LAUGH. (1a) is True just in case TEACHER has a non-empty intersection with SLEEP, that is, there is at least one object which is both a teacher and is asleep.

We may then semantically represent NPs like *some teacher* as functions which associate truth values (True, False) with properties. For example, the EVERY STUDENT function associates True with a property p if and only if STUDENT is a subset of p. Such functions will be called *basic* functions. Some other initial NPs interpreted by basic functions are:

(2) Every boy but not every girl, no boy's cat, all but two boys, every boy but Tom, neither John nor any student, more male than female students, most of John's friends, fewer boys than girls, more of John's than of Mary's articles, John

For extensive empirical discussion of this way of interpreting NPs see Keenan and Stavi (1986). Let us only note further the case of proper nouns. Given a situation, we think of *John* as determining an element b of D (the 'John-object'), and an S like *John sings* is true iff b is an element of SING. Thus *John* is interpreted by that basic function[2] which sends a property p to True iff b is an element of p.

One might imagine that all initial NPs can be semantically represented by basic functions, but in fact they are just a special case of the more general class of interpretations needed for initial NPs. (3) exhibits some non-basic NPs:

(3) you, I, my cat, every friend of mind, the same student, this cat, she, most of the papers he wrote, a different cat

The interpretation of these NPs depends on information given external to the NP itself. In this sense interpretations of these NPs will be said to be *open* (in contrast to those of the NPs in (2) which are *closed*). More generally, an interpretation of a language is a function which assigns

semantic objects (properties, etc.) to occurrences of expressions. An interpretation is *open* at an expression (occurrence) if the choice of semantic object it assigns to it depends on information given external to the expression itself. In intransitive contexts, the dependency is on information given in the non-linguistic context of utterance, so open NPs in such contexts will be called *deictic*.[3] But as more complex syntactic contexts are considered the information on which an open interpretation of an NP depends may be given elsewhere in the linguistic context.

Interpretations of deictic NPs are not radically different from those of basic NPs. Given context information a deictic NP like *you* will denote the same sort of basic function as denoted by *Fred*. Thus *You are quiet* has the same truth value as *Fred is quiet* when context identifies the addressee as Fred.

We may then represent open interpretations of initial NPs as functions from contexts (whatever they are) into basic functions. For example, THIS STUDENT will assign to each context c a basic function (THIS STUDENT) (c). In general the functions denotable by initial NPs will be called *initial* functions. Such functions are either open (deictic) or closed (basic).[4]

2.2 *Transitive verbs and semantic cases*

We interpret transitive verbs like *kiss* as binary relations in the domain D, that is, as sets of ordered pairs of elements of D. So to say that an object b bears the KISS relation to an object d is just to say that the pair (b, d) is an element of the KISS set.[5] Main clause Ss formed from a transitive verb and two independent (basic) NPs will be called *(basic) transitive S*s.[6]

Observe now a surprising complexity difference in the interpretation of basic intransitive Ss and basic transitive ones: The truth value of the former is uniquely determined by the function denoted by the NP and the property denoted by the P_1. But given denotations for a P_2 and two NPs, the interpretation of a transitive S built from them is underdetermined in two ways. First we must specify which of the NPs is 'logical subject' and which 'logical object', and then given that, we must specify which NP is semantically within the scope of the other.

For example, given the binary relation KISS and the basic functions EVERY STUDENT and SOME TEACHER, two S meanings constructable from these elements are expressed in (4b–c). In both, *every student* denotes the 'logical subject' and *some teacher* the 'logical object'. The S meanings differ in that *some teacher* has 'narrow scope' in (4b) and 'wide scope' in (4c).

(4) a. Every student kissed some teacher
    b. Every student has the property that there is a teacher who he kissed
    c. Some teacher has the property that every student kissed him

The two other S meanings are those obtained when *some teacher* is taken as 'logical subject' and *every student* as 'logical object'.

I shall illustrate how SCT formally represents these pretheoretical notions in terms of the two interpretations of (4a). While the formal details can be set aside in the later sections, the existence of our formal explication is important. In SCT these notions are not unexplicated primitives.

To represent the 'object narrow scope' reading in (4b) we want to say that EVERY STUDENT has (= assigns True to) the property [KISSED SOME TEACHER]. To obtain this property from the binary relation KISS and the basic function SOME TEACHER we shall extend the domain of the latter so that it also takes binary relations as arguments, mapping them to properties in the appropriate way. This way of extending basic functions is called their *accusative extension*.

Thus the accusative extension (not yet formally defined) of SOME TEACHER is a function which takes both properties and binary relations as arguments. Its value at properties has already been given. Its value at a binary relation, like KISS, will be a property, namely the set of objects in D which bear the KISS relation to some teacher (that is some object in the TEACHER set).

Similarly the accusative extension of JOHN sends KISS to the set of objects which bear the KISS relation to John (that is, the 'John object'). The accusative extension of MORE STUDENTS THAN TEACHERS sends KISS to the set of those objects b in D which meet the condition that the number of students that b bears KISS to is greater than the number of teachers that b bears KISS to. Formally:

(5) For F a basic function, F_{acc} is that extension of F which sends each binary relation R to the set of objects b which are such that F itself holds of the set of things b bears the relation R to. That is, $F_{acc}(R) = \{b: F(R_b) = True\}$

F_{acc} is called the *accusative extension* of F, and the function ACC sending each basic function F to its accusative extension is a *semantic case*. Note that for any property, p, $F_{acc}(p) = F(p)$.

The reader may compute that the 'object narrow scope' reading (4b) of (4a) is correctly given by (6) below:

(6) (EVERY STUDENT) [(SOME TEACHER)$_{acc}$(KISS)]

That is, this interpretation of (4a) is given by first applying the accusative extension of *some teacher* to the binary relation KISS, obtaining a property, and then applying the basic function denoted by *every student* to that property. This representation is equivalent to $(\forall x)$ (if x is a student then $(\exists y)$ (y is a teacher and x kissed y)).

Consider now the 'object wide scope' reading of (4a) expressed in (4c).

Here we want to say that the basic function SOME TEACHER has a certain property, the property an object has iff every teacher kissed it. To determine this property from the binary relation KISS and the basic function EVERY STUDENT we shall extend that basic function so that it takes that relation to that property. This way of extending a basic function F is called its *nominative extension* and noted F_{nom}.

Informally, the nominative extension of EVERY STUDENT sends a binary relation like KISS to the set of objects which every student kissed. The nominative extension of JOHN sends KISS to the set of objects JOHN kissed. Formally we define:

(7) For F basic, F_{nom} is that extension of F which sends a binary relation R to the set of objects b which are such that F itself holds of the set of things which bear the relation R to b. That is, $F_{nom}(R) = \{b: (F(R^b) = True\}$.

The function NOM sending each basic function to its nominative extension is our second example of a semantic case.

As with accusative extensions, nominative extensions of basic functions take the same values at properties as does the basic function itself. Thus the 'object narrow scope' reading (4b) of (4a) may be given by (8a) below, and the 'object wide scope' reading is given by (8b).

(8) a. (EVERY STUDENT)$_{nom}$[(SOME TEACHER)$_{acc}$(KISS)]
     b. (SOME TEACHER)$_{acc}$[(EVERY STUDENT)$_{nom}$(KISS)]

The analysis in (8b) is equivalent to $(\exists y)$ [(y is a teacher) and $(\forall x)$ (if x is a student then x kissed y)].

Thus we see that merely given two NPs such as *every student* and *some teacher* and a P_2 such as *kiss*, there are up to four [7] ways a transitive S formed from these elements may be semantically interpreted. Two are given by (4b-c). In each of those *every student* is interpreted by its nominative extension and *some teacher* by its accusative one. The two interpretations differ with respect to which of these extended functions take KISS as argument. Equally two further interpretations are obtained when *every student* is interpreted accusatively and *some teacher* nominatively.

Observe that our formal characterization of the interpretative possibilities for (4a) does not mention notions like logical subject and narrow scope. Rather these pretheoretical notions are characterized in terms of the formal analysis. The logical subject of the transitive S is the NP interpreted by its nominative extension. The NP with narrow scope is the one whose interpretation takes the binary relation as argument.

Lastly we note that case extensions make sense in an obvious way when applied to deictic functions. The nominative extension of the deictic function THIS BOY is that deictic function sending each context c to the

nominative extension of [(THIS BOY)(c)]. Semantic case extensions then are defined for all initial functions, both basic and deictic.

3 Natural Language Applications

3.1 *Axioms of Semantic Case Theory*

We have seen above that there may be as many as four ways of interpreting a transitive S merely given the denotations of the transitive verb and those of two NPs. But basic transitive Ss (henceforth batSs) in English are not four ways ambiguous or vague. (9a) below has only two truth conditionally distinct readings and (9b) only one.

(9) a. Every student kissed some teacher
     b. John kissed David

Clearly then interpretations of English satisfy constraints over and above what is given by the initial denotations of NPs and P_ns. One way to state the constraint is:

(10) *English Scope and Case Constraint*
     In basic transitive Ss of the form [NP[V NP]] the VP-internal NP is always interpreted by its accusative extension, the other NP by its nominative extension

Note that (10) constrains the case in which NPs may be interpreted but it does not specify which of these functions takes the binary relation as argument. Thus, in the absence of further constraints, we predict that batSs in English are *scope ambiguous* (either NP denotation may take the transitive verb denotation as argument) but not *argument ambiguous* (that is, *John* in (9b) is uniquely interpreted as nominative, so (9b) cannot have the same meaning as *David kissed John*, in which *John* must by (10) be interpreted accusatively).

Below we shall discuss comparable interpretative constraints in a variety of languages. Each of these constraints is language-specific in that it states semantic properties of expressions of *that* language. On the other hand, these constraints exhibit significant similarities. These I shall factor out and present as the axioms of Semantic Case Theory. They are semantic universals: constraints which, I claim, are satisfied by the ways speakers of all languages interpret transitive Ss. I shall present these universals in terms of the English S & C, justifying that certain properties are general while others are not.

First, not all languages permit scope ambiguities in their batSs. J. Huang (1982), T. Lee (1986) and J. Aoun and A. Li (1987) all support that Chinese batSs have only the accusative narrow scope reading (though

Aoun and Li note the existence of scope ambiguities in passives). The Chinese S & C may in fact be given as for English above with the additional stipulation that the accusative extension take the binary relation as argument.

Second, the English S & C requires that both independent NPs in a basic transitive S be interpreted by case extensions of their initial functions. This I take as axiomatic:

(11) *Case Existence* (CE)
     In basic transitive Ss the independent NPs are interpreted as case extensions of the basic functions they denote

I shall take a moment to justify the axiomatic status of Case Existence as it is a very strong empirical claim (Keenan 1987a, henceforth K-87) and will play an important role in the theory of anaphora developed in section 3.

Consider a trivial case in which CE would be violated. Suppose that interpretations for English allowed that *John* be interpreted as a case extension of *Fred* when *John* occurred in transitive contexts. For example, *Mary kissed John* would mean 'Mary kissed Fred'. Then in a situation in which *John* and *Fred* denote different basic functions it is easy to show that the interpretation of *John* in a batS fails to be a case extension of its initial function, violating Case Existence.

Thus CE is a meaning stability axiom. It says that the interpretations of basic NPs in transitive contexts cannot vary wildly from their interpretations in intransitive ones. In fact (see the Argument Structure Theorem in K-87) it says that the interpretations of basic NPs in transitive contexts are essentially the same as in intransitive ones, all differences being induced by the transitive verb denotation.

Consider a less trivial way in which Case Existence may fail. Suppose that English allowed the basic NP *John* in transitive contexts to be interpreted with the meaning of the reflexive pronoun *himself*. So *Every student admires John* would be interpreted with the meaning that *Every student admires himself* actually has. This would violate CE as follows.

First, an adequate interpretation of the reflexive in transitive contexts is given by the function SELF from binary relations to properties defined in (12):

(12) $\text{SELF}(R) = \{b : (b, b) \in R\}$

An S like *Every student admires himself* will then be interpreted as $(\text{EVERY STUDENT})_{nom}(\text{SELF}(\text{ADMIRE}))$, which is True just in case for each object b with the student property, b bears the ADMIRE relation to b. Now, following K-87 we may show:

(13) *Thm* SELF is not a case extension of any basic function[8]

From the theorem then we know that *John* in transitive contexts may not be interpreted by SELF since it would fail to be a case extension of its (or any) basic function. This observation is generalized in section 3 to show that basic NPs may not be interpreted anaphorically in transitive contexts. As basic NPs are 'r-expressions' in the Binding Theory sense we see that Case Existence covers part of the effect of Principle C of the BT.

More generally, suppose that Case Existence systematically failed. Then even if we knew what objects were in the KISS relation and we could correctly interpret both *John* and *every student* in all intransitive Ss we would have no idea at all what *John kissed every student* meant. This is patently implausible.

Third, the English S & C guarantees that the two NPs in transitive Ss are interpreted in different semantic cases. This I also take as axiomatic:

(14) *Case Distinctness* (CD)[9]

Any interpretation of the independent NPs in a basic transitive S interprets them in distinct cases

There is nothing logically nonsensical about the failure of CD. If both NPs in *John kissed David* were interpreted nominatively it would just mean that the S was argument ambiguous. On the JOHN narrow scope reading it would be true iff David has the property that John kissed him, and on the JOHN wide scope reading it would be true iff John has the property that David kissed him.

But note that satisfying CD does not guarantee the absence of argument ambiguities. They may arise when a transitive S admits of two interpretations, each of which satisfies CD (and CE). Thus the possibility in (15) is not ruled out by CE and CD.

(15) a. John kissed David
           nom   acc (interpretation 1)
           acc   nom (interpretation 2)

This possibility *is* blocked by the English S & C, but as we shall see it is allowed by the S & Cs of certain other languages. The role of CD then is to constrain the ways argument ambiguities may arise: No given interpretation permits them, but an S may be argument ambiguous in virtue of admitting distinct interpretations with different assignments of semantic case.

Fourth, the English S & C identifies the NPs it case interprets in terms of the structure of the batS in which they occur. Thus given two (unambiguous) batSs with the *same* structure (including subcategories of the NPs and verb), the corresponding NPs must be assigned the *same* semantic case. So the interpretative possibility in (16) is blocked.

(16) a. John kissed David
           nom   acc
      b. David kissed John
           acc   nom

If (possibly different) interpretations could assign case as indicated in (16) this would say that which NP was nominative ('logical subject') would be unpredictable from the structure of the S. (It would also say, K-87, that these two Ss are logically equivalent.)

To guarantee that isomorphic batSs in an arbitrary L assign case to the corresponding NPs in the same way (without committing ourselves a priori to the claim that batSs in all Ls have the same structure) we shall avail ourselves of the traditional notion of *paradigm*: a fixed structural frame in which different lexical items can be substituted preserving the form. Thus:

(17) *Case Structure* (CS)[10]

Semantic case interpretation is preserved under grammatical substitutions of the P_2 and independent NPs

CS guarantees for example that the case interpretation of the first NP in each of the Ss in (18) is the same (whatever it is).

(18) a. John kissed David
      b. Harry kissed David
      c. Harry kissed John
      d. David kissed John

Thus *John* in (16a) (=18a) and *David* in (16b) (=18d) must have the same case, whence by CE and CD so must *David* in (16a) and *John* in (16b).

Case Existence, Case Distinctness and Case Structure are the only properties of transitive S interpretations that I am prepared to take as universal at present. Before turning to the statements of S & Cs in other languages, however, a few general comments regarding the empirical nature of these axioms and the English S & C will be helpful.

(i) Given the axioms, the statement of the S & C for any given L need only mention L-specific properties. The S & C is understood to be the conjunction of the axioms with the S & C as given. Often it is sufficient to stipulate the case of just one NP, the other being thus in the other case by CE and CD.

(ii) The English S & C only covers batSs of a certain form and is thus incomplete. In giving S & Cs for other Ls I concentrate on the widely attested S types but make no attempt at completeness.

(iii) Determining the correctness of a given S & C is an empirical matter. A given statement may be falsified by showing that it fails to predict speakers' judgments of argument ambiguity or scope ambiguity.

(iv) Commonly different structural features converge on the same assignment of semantic case. For example, the English S & C could be given as: 'Interpret the immediate preverbal NP nominatively' or 'Interpret nominatively the NP with which the verb agrees.' From the point of view of language users (and learners) this redundancy is useful (and, as Chomsky 1986: 181 notes, characteristic of biological systems).

(v) Modulo redundancy the relevance of a given structural property to determining semantic case interpretation may be checked by forming a different batS with the same NPs and P_2 in which that structural property is absent (as we did in analyzing (16a–b)). If a change in the property induces a change in argument structure (for example, one S means 'John loves Mary' and the other means 'Mary loves John') then the property is relevant (though it may follow from others).

(vi) With a further condition the remarks in (v) extend to cross-language comparisons of case interpretation: For example, *given* the English S & C, suppose that the Japanese S & C determined the case interpretations in (19a) as indicated.[11]

(19) a. Hanako-ga Taroo-o nagutta
         acc   nom   hit
     b. Taroo hit Hanako

Then, if *Hanako*, *Taroo* and *nagutta* have the same denotations as their English glosses and *Hanako (Taroo)* is interpreted in the same case in (19a) as it is in (19b) then (19a) and (19b) must have the same truth value. But this is, in fact, false. Thus the Japanese S & C is wrongly stated if the assumptions about the sameness of denotations hold.

Finally let me emphasize an obvious but important point. Semantic cases and semantic scope are defined solely in terms of binary relations and functions of a certain sort. They make no reference at all to how P_2s and NPs denoting such relations and functions are presented syntactically. Logically then the syntactic structure of a transitive S and semantic case and scope interpretation are *independent*. It is an empirical matter whether there are any universal correlations between specific aspects of syntactic structure and semantic case assignment. If it turned out that in all Ls, the nominatively interpreted NP preceded the accusatively interpreted one (or vice versa) this would be empirically significant as nothing in the semantic analysis of case is relevant to that claim.

3.2 *Language specific case constraints*

We investigate here the Case Constraints[12] (CCs) in several languages. I argue that (i), based on judgments of argument ambiguity, there are many languages in which morphological marking on NPs and verbs is criterial in stating CCs and VP constituency is not. And (ii), VP-nominative languages exist.

I will say that a language L 'has a VP' if its batSs present one NP in constituency with the verb to the exclusion of the other. If constituency with the verb is sufficient to determine the semantic case of the NP then L's Case Constraint will be called *configurational*. There are two logical possibilities here: the VP internal NP is interpreted nominatively (and L is called *VP-nominative*), or it is interpreted accusatively (and L is called *VP-accusative*).

3.2.1 *Morphological case marking and argument ambiguities*   We begin with the obvious example of Warlpiri (Hale 1983; Jelinek 1984).

(20) Warlpiri Case Constraint (WCC)
     In basic transitive Ss interpret a *-ngku* (*-rlu*) suffixed NP as nominative if there is one; otherwise interpret a *-Ø* suffixed one as nominative.[13]

(20) tells us that in (21a) *karnta* 'woman' is unambiguously nominative (and so by CE and CD 'man' is accusative). In (21b) 'child' is nominative and 'man' accusative.

(21) a. Karnta-ngku ka -Ø -Ø ngarrka-Ø nya-nyi
        woman-erg pres-she-him man   -abs see-nonpast
        'The woman sees the man'
     b. Kudu- Ø ka- Ø-la ngarrka-ku pada-ni
        child- abs pres- he-him man   -dat wait- nonpast
        'The child is waiting for the man'

As is well known from Hale's work, all six relative orders of the two NPs and verb in (21a) are about equally acceptable preserving the translation (the position of the Aux '*ka-*' is fixed). So change in word order does not induce a change in argument structure, so word order is not criterial for determining semantic case. But interchanging the suffixes *-ngku* and *-Ø* (zero) in (21a) does induce a change in argument structure, the resulting S meaning 'The man sees the woman.' So morphological NP marking is criterial for semantic case interpretation.

Equally 'VP constituency' is not relevant. Even if Warlpiri had a VP (and all workers agree that it does not at observable structure) each configurational CC incorrectly predicts that interchanging the *-ngku/-Ø* suffixes in (21a) induces no change in argument structure since no change in VP constituency results.

I note, following the detailed and convincing exposition in Jelinek, that semantic case assignment in Warlpiri can also be stated in terms of the pronominal affixes on the Aux plus statements of the form '*-ngku* marked NPs if present have the same case as that assigned to the first affix.' This approach preserves the claims above concerning the relevance of morphological marking and the irrelevance of VP constituency.

The morphological case marking system in Warlpiri is quite efficacious. Despite the great word order freedom there appear to be no batSs in Warlpiri which are argument ambiguous. Observe moreover (characteristic of morphological case marking languages) that there is no one to one correspondence between semantic case and morphological case: -Ø marked NPs may be interpreted accusatively, (21a), or nominatively, (21b).

Other languages which arguably lack a VP and have their CCs given in terms of morphological markings on NPs are Latin, Korean, Hindi, Md.E. Armenian and Malayalam. In the latter case, as Mohanon (1982) shows, morphological NP marking is criterial and is not redundantly coded in terms of linear order (which is free, clause internally), or VP constituency (which he convincingly argues against).

(22) Malayalam Case Constraint (MCC)

In batSs interpret a -*e* (-*ye*) marked NP accusatively if there is one; otherwise interpret some inanimate -Ø marked NP accusatively

The MCC correctly predicts the lack of argument ambiguity in (23) and the presence of such ambiguity in (24).

(23) Kutti- Ø annay   -ye kantu
     child-   elephant-   saw
     'The child saw the elephant' *'The elephant saw the child'

(24) Kallə -Ø kuppi-Ø potticcu
     stone -   bottle-   broke
     'The stone broke the bottle' or 'The bottle broke the stone'

Merely interchanging the NP affixes in (23), which preserves grammaticality, induces a change in argument structure, the result meaning 'The elephant saw the child.' So NP markings are criterial for semantic case assignment and word order is not. And even if Malayalam had a VP, constituency with the verb in (24) cannot determine its semantic case since both are possible.

A further example of interest here is Japanese. Chomsky (1986), Saito and Hoji (1983) and Hoji (1987) argue that Japanese has a VP, whereas Farmer (1984), Whitman (1987) and the much earlier work of Hinds (1974) argue against. But this issue turns out to be irrelevant to the statement of the Japanese Case Constraint. (I am indebted to George Bedell for most of the discussion of the Japanese data below.)

(25) Japanese Case Constraint (JCC)

In a batS, interpret an -*o* marked NP accusatively if there is one; otherwise interpret a -*ga* marked NP nominatively.

The JCC (see note 11) uniquely determines case assignment in (26) and tells us, correctly, that (27) is argument ambiguous.

(26) Taroo-ga Hanako-o nagutta
     Taroo   Hanako hit
     'Taroo hit Hanako' *'Hanako hit Taroo'

(27) Taroo-ga Hanako-ga suki-da
     Taroo   Hanako   likes
     'Taroo like Hanako' or 'Hanako likes Taroo'

The ambiguity is preserved if either -*ga* is replaced by -*wa*. And as in (24), neither configurational CC predicts the ambiguity in (27), so VP constituency appears irrelevant to semantic case assignment.

An importantly different type of CC which cannot be given configurationally at S-structure is exemplified by Navaho (Platero 1982; Frishberg 1972; Sapir and Hoijer 1967). Here the CC is sensitive both to (non-pronominal) verbal morphology and to semantic relations between the NPs. In general batSs in Navaho have the form in (28).

(28) $[NP_1 NP_2 \text{ x-V}]$, where x = *yi*- or x = *bi*-

The choice of prefix *yi*- or *bi*- is sensitive to certain 'Chain of Being' properties of the NPs. If the prefix is *bi*- then NP_1 cannot be a bare inanimate NP, the lowest position on the Chain of Being Hierarchy given by:

(29) Chain of Being Hierarchy (CBH)

Human > Animate > demonstrative inanimate > bare inanimate-human

Frishberg investigates twenty-two transitive sentence types which vary with regard to the position of the NPs on the CBH and the acceptable choice of verbal prefix. In our terms, her results are exactly predicted by the Nahavo Case Constraint in (30):

(30) Navaho Case Constraint

In batSs of the form [NP NP x-V], interpret the first NP nominatively if x = *yi*- and interpret that NP accusatively if x = *bi*- *and* the position of that NP on the CBH is greater than or equal to that of the other NP

Observe that when the prefix is *bi*- and NP_1 is not greater than or equal to NP_2 on the CBH then semantic case assignment is not uniquely

determined. Thus in such a case the sentence is predicted to be argument ambiguous, and this is correct as (31) from Frishberg illustrates.

(31) shilį́į́   shinaai   bi-ztał
       my horse my brother   -kick
       'My horse kicked my brother' or 'My brother kicked my
       horse'

In our terms the CC given in Platero (1982: 295), adapted from the one in Hale et al. (1977), does not predict the argument ambiguities observed in Frishberg. Nor is the ambiguity predicted if Navaho is either VP-nominative or VP-accusative.

3.2.2 *VP-nominative languages*   I turn now to two Ls which arguably have a VP but in which the VP internal NP is interpreted nominatively. The first is Toba Batak (Malayo-Polynesian; Sumatra) studied extensively in Schachter (1984a, 1984b), on which the analysis below is based.

Transitive Ss in Toba are verb initial with the form in (32), illustrated in (33).

(32) [[x-V NP]NP], where x = M- or x = D-

(33) a. Mang-ida si Ria si Torus
              -see art Ria art Torus
          'Torus sees Ria' *'Ria sees Torus'
      b. Di-ida si Ria si Torus
              -see art Ria art Torus
          'Ria saw Torus' *'Torus saw Ria'

Both verb forms in (33) are transitive in requiring two NPs to form an S, but the main clause Ss are not exactly semantically equivalent, though as Schachter notes translating them merely as present (M- forms) and past (D- forms) is not quite accurate. A better though vaguer statement would be that main clause D- forms are perfective, and so often translatable as past, whereas main clause M- forms are imperfective and so often translated as simple present, generic or habitual. The distinction is a little loose and not at all preserved in subordinate clauses.

(34) Toba Batak Case Constraint (TBCC)
      In batSs interpret the immediately postverbal NP as accusative if the verb prefix is M- and nominatively if the prefix is D-

Schachter (1984b) argues extensively and convincingly that, regardless of the choice of prefix, the postverbal NP in Toba forms a syntactic constituent with the verb. Summarizing his evidence: adverbials may not

intervene between the verb and its following NP. Only the second NP can be extracted (relativized, questioned by movement, etc.), the first cannot be moved away from its verb. Nor does the first NP undergo pronominalization by deletion in discourse, in distinction to the second. Further, Emmorey (1984) shows that the nuclear pitch accent always falls on the last stressed syllable of the predicate regardless of the syntactic type of predicate (AP, PP, etc.). This rule treats the postverbal NP in (32) as the final element of the predicate, again regardless of the choice of prefix. Finally, observe that expressions of the form [x-V NP] may coordinate (regardless of the choice of x!).

(35) [Di-tuhor si Ore jala di-lompa si Ruli] mangga
         buy   art Ore and   cook   art Ruli mangos
      'Ore buys and Ruli cooks mangos'

(36) [Di-antuk si Ria jala man-ipak si Rotua] si Bissar
         hit   art Ria and   kick   art Rotua art Bissar
      'Ria hit Bissar and Bissar kicked Rotua'

In sum, the evidence that [x-V NP] in (33a–b) forms a syntactic constituent is stronger than that a transitive verb and its postverbal NP in English form a constituent. D- sentences in Toba then are VP-nominative.

A second example of VP-nominative Ss is given by (Tamazight) Berber. Saib (1975), Penchoen (1973), Abdel-Massih (1971), Guerssel (1986), Guerssel and Hale (1987) and my own native speaker work in 1975 are drawn on freely below. I also draw on Sadiqi (1986), Ennaji and Sadiqi (1986) and Ennaji (1985), who study the closely related dialect of Ayt Hssan.

All sources treat Berber as a strict head first language with basic transitive S order V + NOM + ACC. In the discussion below I use the term 'subject' to refer to the nominative NP in a transitive S and the only independent NP in an intransitive S.

Direct evidence that the postverbal nominative NP forms a constituent with the transitive verb is given by the distribution of NPs in the 'construct state'. (See Borer 1984 for discussion of these forms in Md. Hebrew.) NPs in Berber occur in one of two morphological forms: the free (= citation) form and the construct form. Grammars (Penchoen 1973: 19–21) derive the construct form from the free from by modifying the vowel in the first syllable. (See Guerssel 1987 for an insightful non-traditional analysis.[14]) Proper nouns appear to have only one form. The following examples will be used in the discussion:

Free form: aryaz 'man' arba 'boy' tarbatt 'girl'
Construct: uryaz ·   urba   terbatt

A noun occurs in the construct form if it meets one of the conditions (37)–(41) below; otherwise it occurs free.

(37) *Genitive complements of noun heads*

    a. axam uryaz   b. axam n terbatt
       tent man   tent of girl
       'the man's tent'   'the girl's tent'

    c. illi   -s uryaz-ad
       daughter-his man -this
       'this man's daughter'

    d. zəg- guguɣ (n) irumiyən zi-   tmazirt
       since- leaving (of) French from-country
       'since the French left the country'

(38) *Objects of quantity words* (numerals, 'much', 'many', etc.)

    a. yun uryaz   b. ša   uryaz
       one man   some man

The preposition *n* 'of' often occurs between the quantity word and the noun. The quantity word itself may function as an NP: *ur ɣur-i ša* lit.: 'not to-me some' = 'I don't have any.' Plausibly then these structures are special cases of (37). Note that modifying adjectives, even when they occur preverbally (rare), do not govern the construct state on their heads *yar-aryaz* 'bad man'.

(39) *Objects of prepositions*

    a. i-   terbatt   b. tama (n) uryaz
       to/for (the) girl   near (of) (the) man

Guerssel (1987) shows that most of the independent 'prepositions' like *tama* are in fact nouns, so these cases are just further examples of (37).

(40) *Postverbal NP in intransitive Ss*

    a. i- zyert urba   b. lla t- alla terbatt
       he-tall boy   imp she-cry girl
       'The boy is tall'   'The girl is crying/cries'

(41) *Postverbal NP in transitive Ss*

    a. i- annay urba tarbatt   b. t- annay terbatt arba
       he-saw boy girl   she-saw girl   boy
       'The boy saw the girl'   'The girl saw the boy'
       *'The girl saw the boy'   *'The boy saw the girl'

Considering only the first four cases it seems clear that an NP is in the construct state just in case it is the complement of the head of its phrase and so certainly forms a constituent with it. Moreover, we would not hesitate to make the same claim for the postverbal

NP in transitive Ss if it were interpreted accusatively. But our earlier discussion shows it is unproblematic to interpret such an NP nominatively. For example, the interpretation of (41a) may be given by $(GIRL)_{acc}[BOY_{nom}(SEE)]$.

Morphological evidence then directly supports a process of construct state assignment under conditions of lexical government by noun heads, prepositions, transitive and intransitive verbs, henceforth called *C*(onstruct)-*governors*.

Right adjacency is a necessary condition for construct state assignment. Topicalized NPs occur to the left of their C-governors and are not in the construct state (see Shlonsky and Sigler 1987 for insightful discussion).

(42) a. aryaz, i- annay tarbatt
       man, he-saw girl
       'The man saw the girl'

    b. axam uryaz ad i- meeqqur
       tent man this it-big
       'The tent of this man, it is big'

    c. aryaz ad, axam-nns, i- meeqqur
       man this tent- his, it-big
       'This man, his tent, it is big'

Note that in (42b) the topicalized NP 'the tent of this man' is in the free form, as reflected by the *a*-initial consonant on the head, and its complement 'this man' is as expected in the construct state. In the double topicalization in (42c) 'this man' is not right adjacent to its head and thus occurs free.

Further facts support that mere right adjacency to a C-governor is not sufficient to induce construct marking, but that the right adjacent element must form a constituent with the governor. In (42a) 'girl' is right adjacent to the verb 'saw' but remains in the free form. This follows if it does not form a (VP) constituent with the verb.

Equally when a nominative NP is extracted, as in relative clauses, Wh-questions and Clefts, the accusative NP does not assume the construct form. Plausibly again this is because it has not moved into the nominative position forming a constituent with the transitive verb.

(43) aryaz nna i-   annay-n   tarbatt
     man dem part-saw -part girl
     'the man who saw the girl'

Further, like VSO languages generally (Chung 1983), Berber is a subject pro drop language. Verbs agree with their construct NPs in person, number and gender. And we observe that in Ss like (44a–b) the accusative NP is free.

(44) a. ur ssin- əx aryaz i- taddart
      not know- 1sg man in-house
      'I don't know the man in the house'

    b. i- ssifəd amazan
      he-sent   messenger (construct state = umazan)
      'He sent a messenger'

Various analyses of such constructions treat the full NP subject position as either not present at all or else filled with a null expletive. In either case the accusative NP will not form a VP constituent with the transitive verb and thus, predictably, not be in the construct form. Equally in transitive imperatives (Ennaji 1985: 283) the subject addressee phrase is absent but the accusative NP does not go in the construct state.

By contrast, in Passive and Raising to Subject structures which (on current theories) do move an NP into the subject position we expect that that NP will be in the construct state. This expectation is borne out:

(45) a. i- ttcu uqqzin aysum
      he-ate dog   meat (−con)
      'The dog ate meat'

    b. i- ttw- attc uysam
      it-pass-eat meat (+con)
      'The meat has been eaten'

Raising to Subject, only attested for two verbs (Sadiqi 1986: 152) also supports the claim. The proper noun *Mamma* in (46b) (Wager 1976) triggers fem. sg. verb agreement, as opposed to the impersonal masc. sg. form in (46a). (46c) from Abney 1987 shows the postverbal NP in the construct state as expected.

(46) a. i- dher   is   t-ssen   Mamma ad t-ez   utsu
      it-appears that she-knows Mamma fut she-makes couscous
      'It appears that Mamma knows (how) to make couscous'

    b. t- dher   Mamma is   t-ssen   ad t-ez   utsu
      she-appears Mamma that she-knows fut she-makes couscous
      'Mamma appears to know (how) to make couscous'

    c. i- dher uryaz is-   t- i- zru Bassu
      he-seems man   Comp-him he-saw Bassu
      'The man seems that Bassu saw him'

As further support for the coherent pattern presented above consider first that notional indirect objects are always constructed with a preposition, as in (47).

(47) ad i- us uryaz aɣrum i- lmsakin
     fut he-give man bread to-poor
     'The man will give bread to the poor'

Thus in nuclear Ss all NPs required by the predicate occur in the construct state except the accusative. In this respect the accusative NP resembles the nominative one in English Ss. It is the only one whose form (?case) is not determined locally – either by the verb or a preposition.

The freedom of accusatives is further reflected in the fact that they are freely extracted, whereas extraction of other arguments is subject to a licensing condition: Their governors occur in a marked form. In the case of subjects, both transitive and intransitive, the verb goes in a participial form $i\text{-}\ldots\text{-}n$ (sg.) or $\text{-}nin$ (pl.) losing its gender agreement, as illustrated in (43). In the case of indirect objects the prepositional $i\text{-}$ is retained in a marked form $mi\text{-}$ and fronted, (48a). (And more generally when objects of type (39a) Preps are extracted the Prep is retained and fronted, following the relative or focus marker.) But when accusatives are extracted, as in (48b), no marked form of its nominative VP is present, nor is a clitic pronoun retained (in distinction to topicalization cases).

(48) a. tarbatt nna mi i- sfa   uryaz lektab
      girl   rel to he-gave man book
      'the girl to whom the man gave the
      book'

    b. tarbatt nna i- nnay uryaz
      girl   rel he-saw man
      'the girl that the man saw'

(Possessor NPs are not directly extractable but are construed as datives taking the long form *mi* of the preposition *i-* 'to'. 'The woman whose husband died' is literally 'the woman to whom the man died' (Penchoen 1973: 69; Ennaji 1985: 49).

Fourthly, an overt (untopicalized) nominative NP is rather rigidly fixed in the immediate postverbal position (Sadiqi 1986: 10) as all the examples illustrate. But the relative order of the accusative NP and indirect objects is freer. According to Johnson (1966: 49) the more highly specified of the two will occur in final position. Compare (49) with (47).

(49) ad i- us uryaz i- lmsakin aɣrum uasnat
     fut he-give man to-poor   bread (of) yesterday
     'The man will give to the the poor the bread of
     yesterday'

The absence of word order alternation between nominatives and accusatives then supports that the nominative forms a constituent with the verb.

A fifth piece of evidence comes from existential/possessive (E/P) Ss. We observe first that pronominal accusatives and PPs behave as clitics, attracting to an element of the verbal complex (including an overt Comp). The host is often an aspect marker like *lla* or *ad*. But when such are not present the clitic goes immediately postverbally (not blocking construct state assignment to the subject). The E/P S below is illustrative:

(50) t- əlla ɣur-s tfunast
    she-exist to-him cow (fem, +construct)
    'He has a cow'

Note that 'cow' is in the construct state and triggers verb agreement. Moreover, when extracted it triggers the participial form of the verb (Penchoen 1973: 70), confirming its status as subject.

Now, in the particular case of E/P Ss the verb is optional (a 'designated element case' of recoverable deletions). In such Ss, however, the subject cannot form a constituent with the verb, so we expect it to be in the free form, which is correct:

(51) ɣur-s tafunast
    to-him cow (−construct)
    'He has a cow'

A last piece of suggestive evidence is given in Choe (1987). She observes that Berber presents many TV (transitive verb) + Subject idioms, but virtually no TV + accusative idioms. For example, from the TV 'hit', which forms ordinary transitive Ss like 'The man hit the boy' we may form 'idioms' like 'A sneeze hit' (the cat), 'Toe-stubbing hit' (the boy), in which the parenthesized items occur as accusatives.

These facts are suggestive but inconclusive. To infer from semantic facts to syntactic ones we need some empirically established principles of correlation. In the case at hand the obvious suggestion is 'Only constituents can be interpreted idiomatically.' But no sooner said than counterexemplified. The idiomatic italicized items below are not constituents.

(52) a. We *cooked* John*'s goose*
    b. We *took the wind out of* his *sails*

(53) a. We *threw* him *to the dogs*
    b. We *put* him *on the spot*

Similarly in Ss like *Weariness overtook him*, *Misfortune befell him*, *Panic seized him*, *Sleep overcame him*, *Disease cut him down in the prime of life* the abstract nature of the subject triggers a non-literal interpretation of the verb thus yielding a semantic relation between the TV and its subject

not present between the TV and its object. The examples are not dissimilar to Choe's but do not justify considering the TV + Subject a syntactic unit.

More generally Keenan (1984) exhibits a battery of semantic properties which tie accusatives to their verbs in distinction to nominatives. But no conclusions regarding syntactic constituency follow. Choe's facts then remain suggestive.

In sum, Berber presents strong evidence that the nominatively interpreted NP forms a constituent with the transitive verb to the exclusion of the accusatively interpreted one. Berber then is a second example of a VP-nominative language.

3.2.3 *'Explaining' VP-nominative languages*[15]   As the existence of VP-nominative languages appears to violate both current and traditional grammatical practice (see Hinds 1974 for some enlightening discussion of other traditions) let me suggest a plausible mechanism whereby a language might reasonably come to be VP-nominative.

The suggestion is just the generalization of the observations concerning construct state NPs in quantity expressions and (many) PPs. Synchronically they may be analyzed as noun complements of nouns. I suggest then that historically Verb + Subject constructions in Berber also originate as nominal ones. So historically 'John hits Bill' is an equative S like 'John's hitting (one) (is) Bill' and 'John laughs' is historically a kind of existential like 'John's laughing (is).' The constituency of transitive subjects with their verbs is explained on the grounds that historically they are possessors of the verb.

This suggestion is at least not prima facie implausible. Generative grammar (e.g. Chomsky 1986: 64) has revealed strong similarities between possessors in NPs and subjects of Ss. They behave similarly with regard to control of anaphors and infinitives (*John's criticism of himself / John criticized himself*; *John's desire to leave / John desired to leave*). They behave similarly with regard to blocking extractions. And in many subordinate positions possessives and tensed Ss occur almost in free variation: *We worked hard before John's arrival / before John arrived*; *John's leaving / That John left surprised me*.

If this historical analysis is correct, it would account for the similarities between Pred + Subj structures and Possessive structures already observed in Berber. It would in addition account for the fact that predicates agree in gender with their subjects and that subject agreement clitics and possessor clitics are morphologically similar (in particular in the plural, both genders) (Penchoen 1973: 25–7).

Direct diachronic evidence is lacking for Berber, but is available for the genetically related Middle Egyptian (daughter language Coptic). Callender (1975a, 1975b) (see also Schenkel 1975) provides quite striking evidence that Verb + Subject structures in M.E. developed from nominal forms. Several of the forms are reconstructed as nominative, accusative or genitive case forms of nominals in Proto-Afroasiatic. Moreover, all of the

eight verb 'bases' take their subject pronominal forms from the possessor series. Callender explicitly argues that the nominal construction was basic and the verbal one built upon it (see his Appendix 1). Equally Prep + NP constructions are formed on the Head + Possessor one. The following examples from Callender (1975a) illustrate some of these points.

(54) a. pr   -i   b. m   r?   n(y) wbnw -f
         house-my   from mouth of   wound-his

     c. m3 -n -i   sw   d. ist wn   hjmt-f
         saw-of-my it   lo exist wife -his
         'I saw it'   'Now he has a wife ...'

This historical development of M.E. supports the plausibility of a similar development in Berber. Moreover, even superficial inspection of bound morphology shows that Berber and M.E. are reasonably closely related.[16]

In fact, given Callender's analysis we might expect it to have reflexes in other Afroasiatic languages. And this is the case in Md. Hebrew. Borer (1984) draws on the similarities between pronominal clitics on prepositions and those in construct state possessive structures. But the pronominal 'agreements' on past tense verbs show the same similarities (S. Mordechay, personal communication), and both past and present tense verbs agree with their subjects in gender. And as in Berber, numerical constructions in Hebrew exhibit construct state morphology.

Once the historical plausibility of regarding transitive subjects as possessors is accepted it becomes surprisingly easy to find further candidates for such a development. Some quickly sketched examples relevant to the concerns of this paper are:

(i) *Isthmus Zapotec* (Oto-Manguean, S. Mexico; Pickett 1960, 1975) is a strict head first [V + NOM + ACC] language which presents a complete formal identity of VERB + Subj, Head + Poss and Prep + NP constructions. Aside from some obvious Spanish borrowings, the 'prepositions' of Zapotec are synchronically body part nouns: 'to' is the word for 'face, eye'; 'on, on top of' is 'head', 'in, inside of' = 'belly', 'next to' = 'side', 'behind' = 'back'. The pronominal clitics on verbs, heads of possessives and 'prepositions' are identical and fairly rich. Two numbers and three pesons are distinguished, with inclusive/exclusive forms in 1st pl. In the third person, both sg. and pl., three 'genders' are marked: human, non-human animate and inanimate. The third person clitics occur in complementary distribution with full NP subjects, possessors, 'objects' of prepositions. Zapotec does possess independent pronouns, but they are used for apposition, topicalized structures and *accusative* NPs.

(ii) *Jacaltec* (Mayan; Craig 1977) is a strict head first [V + NOM + ACC] language, in which the TV + Subj, Head + Possessor and Prep + NP constructions occur in the order given and show the same agreement/

clitic morphology. Certain intransitive S types are constructed directly on the historical model suggested for Berber. For example, 'I have money' is literally 'Exist my money' (Craig 1977: 27). More detailed similarities with Berber are tantalizing: When objects of prepositions are extracted the preposition is retained, either pied piped (but postposed to the extracted element) or stranded; when transitive subjects are extracted the verb loses its agreement and takes a special affix -$n(i)$. Accusatives by contrast are freely extracted leaving no pronominal trace and requiring no licensing conditions.

Jacaltec also presents TV + Possessive Subject idioms in which the possessor is referential but the V + head are idiomatic:

(55) x- s- cha' ha- wi'   ha- way sunil-bal tz'ayic
     asp-it-suit 2sg-head 2sg-sleep all-extent day
     'You would like to sleep all day'

Note that the main verb shows third person transitive subject agreement with 'your head' but that it is the second person possessor which controls the agreement on the non-finite (aspectless) lower verb 'sleep', clearly a case of possessor NPs exhibiting control properties of subjects of S.

These idioms appear structurally similar to the *cook John's goose* type in English except that the latter are V + accusative constructions whereas the former are V + nominative ones.

(iii) *Batak and W. Malayo-Polynesian* (W.MP). The VP-nominative Ss in Toba, [[di-V John]Mary] = 'John V'd Mary', show clear traces of nominal origins for the TV + Subject. If the nominative NP in such Ss is a first or second person pronoun it replaces the *di-* prefix in the same form it has when functioning as a possessor on a noun head. So 'I saw Mary' looks literally like 'My-see(ing) (is) Mary' (The copula is null).

Quite generally W.MP languages provide synchronic support for the nominal origin of many of the verb forms. In the non-actor focus forms in Tagalog (Philippines) the pronominal agents are drawn from the possessor series. In Malagasy (Madagascar) both pronominal and full NP passive agents attach to the verb with the overt morphology with which possessors attach to their heads. In Rukai (Taiwan), P. J. K. Li (1973) notes the use of both 'subject' and possessor pronominals on the verb, yielding pairs like *eat-I the fish* and *eat-my the fish* for 'I ate the fish.'

Overall then the case that Verb + Subject structures may derive historically from nominal ones in which the subject is a noun complement is plausible and receives much support. That subjects may form a constituent with transitive verbs then is much less startling than current linguistic practice suggests.

4 Semantic Case Theory and the Binding Theory

SCT is only a theory of how simple Ss are interpreted. But it is built on a fundamental semantic asymmetry, that between nominative and accusative interpretations, and it is reasonable to query whether other subject–object asymmetries can be reduced to this one or are independent. We consider here just the following asymmetry in Standard English:

(56) a. Every student criticized himself
     b. *Himself criticized every student

(56a) is a meaningful sentence and has its truth conditions given by: $(EVERY\ STUDENT)_{nom}[SELF(CRITICIZE)]$. By contrast (56b) does not have this meaning, having no meaning at all.

Within a BT framework these facts are characterized in terms of syntactic asymmetry between the two NPs. *Himself*, an anaphor by stipulation, must be coindexed with a C-commanding NP. (56a) provides such an NP but (56b) does not. Nor does (57) which the BT thus blocks for the same reason as (56b).

(57) *Himself is being obnoxious

How might we represent these facts in SCT terms? Observe first that given the interpretation of *himself* as SELF and the interpretative fact in (58) we can already account for (57).

(58) *Himself, herself* lack extra-linguistic deictic interpretations in Standard English

The reasoning is as follows: Suppose that the S in (57) were grammatical. Then *himself* would be initial (by definition). From (58) it must be a basic NP. By Case Existence its interpretation in (56a) must be a case extension of the basic function which it denotes. But by (13) SELF is the case extension of no basic function. Thus *himself* is not initial, that is, the S in (57) is ungrammatical.

In this reasoning our use of the fact that *himself* is interpreted as SELF corresponds to the BT assumption that *himself* is an 'anaphor'. But in distinction to the BT we need the claim that *himself* lacks a deictic interpretation. Thus the SCT allows that there could exist a language like St.Eng. except that in addition to its anaphoric interpretation as SELF *himself* could also be interpreted deictically. In such languages SCT does not predict the ungrammaticality or uninterpretability in (57). I exhibit languages of this sort below.

Our reasoning above does not, however, extend to (56b) since *himself* is not initial there. In fact, logically, it is quite possible to interpret (56b) as a

paraphrase of (56a). Simply apply SELF to CRITICIZE and then apply the accusative extension of EVERY STUDENT to the resulting property. (The first step is the same as that used to get 'subject narrow scope' readings). The truth value of $(EVERY\ STUDENT)_{acc}$ at SELF(CRITICIZE) is the same as that of $(EVERY\ STUDENT)_{nom}$ at that property, so (56b) and (56a) are equivalent.

As (56b) does not allow this interpretation the interpretative constraints on St.Eng. must be extended beyond the axioms of SCT and the English Case Constraint. We shall then require that interpretations of English satisfy the *Nominative Reference Condition* below. The underlying idea of the NRC is that the referential possibilities of nominative NPs in transitive Ss are the same as those of the only independent NP in intransitive Ss.

To state this idea more rigorously let us write *basic*(T) for the result of replacing each independent NP occurrence in T by a basic NP. Then, where T is a transitive S, an independent NP occurrence in T is said to be *structurally nominative (accusative)* iff the basic NP which replaces it in basic(T) may be interpreted by its nominative (accusative) extension.[17]

(59) *Nominative Reference Condition* (NRC)
      In main clause transitive Ss a structurally nominative NP is interpreted by a nominative case extension of an initial function

The judgment in (56b) now follows since *himself* there is structurally nominative but its only interpretation SELF is not a case extension of an initial function.

4.1 Comparing the BT with NRC

Both the BT and SCT + NRC provide accounts for the asymmetry in (56) and the judgment in (57). Below I provide several reasons for preferring the SCT based account.

(i) The BT blocks (56b) and (57) for the same reason, whereas the SCT-based approach requires more (the NRC) to block (56b) than (57). As there is a logical possibility of a bound reading in (56b) not present in (57) more *should* be required to block it.

(ii) Considerations of descriptive adequacy favor the SCT-based approach over the BT one. They make the same predictions for English, as the structurally nominative and the C-commanding NP coincide. But they make different predictions for VP-nominative languages, and the evidence supports the SCT theory. For Toba Batak observe (Schachter 1984b):

(60) a. [Di-ida si   Torus] dirina
             -see art Torus self
         'Torus saw himself'

  b. *[Di-ida dirina] si Torus
      see self   art Torus

(60b) shows that the structurally nominative NP cannot be the reflexive despite being asymmetrically C-commanded by the accusative. Note that it is not the case in Toba that anaphor distribution is determined by some sort of left–right override to the C-command conditions in BT. In M-sentences the structural accusative precedes the nominative one and we find, as expected, that anaphors precede their antecedents in such Ss.

(61) a. [Mang-ida dirina] si Torus
          -see self   art Torus
      'Torus sees himself'

  b. *[Mang-ida si Torus] dirina
      -see art Torus self

Similarly reflexives in Berber support the NRC over the BT:

(62) a. i- wwet urba ixf- nns
          he-hit   boy head-his
      'The boy hit himself'

  b. *i-wwet ixf- nns arba
      he-hit head-his boy
      'Heself hit the boy'

As per the NRC the reflexive in (62b) cannot be structurally nominative, despite being asymmetrically C-commanded by 'boy'.

VP-less languages also support the SCT approach. The NRC applies, correctly, to these Ls whether there is a VP or not. But the BT requires one. Otherwise the NPs in a transitive S would C-command each other and Principle C blocks a full NP coindexed with a C-commanding anaphor. But such a prediction is clearly incorrect. Consider (63) from Warlpiri (Hale 1983).

(63) Ngarrka-ngku ka- Ø- nyanu nya-nyi
      man   -erg Pres-he-self   see- nonpast
      'The man sees himself'

The Warlpiri CC (20) identifies the -*ngku* marked NP as nominative, and since it is basic (63) satisfies the NRC.

More problematic for the BT are languages like Korean, Hindi, Md. Eastern Armenian and Kannada (Bhat 1978: 65). These Ls are basically verb final with fairly free NP order preverbally. Semantic case is determined morphologically with Korean exhibiting topic marking as in

Japanese. The problem is that the freedom of NP order is retained by reflexives.[18] From Korean (H. S. Lee, personal communication):

(64) a. Caki-casin-eke Kim-ŭn   silmanghaŏssta
          self   -dat Kim-NOM disappointed
      'Kim was disappointed in himself'

  b. *Caki-casin-ŭn   Kim-eke silmanghaŏssta
      self   -NOM Kim-dat disappointed

Here -(*n*)*ŭn* is the topic marker replacing the morphological nominative suffix -*i* (-*ka*). The relative order of the two NPs in each case may be changed preserving the judgments. Further examples of this sort using verbs with different morphological case paradigms may be found in O'Grady (1985) and Park (1986).

Similarly in Hindi (S. Ali, personal communication) both orders are possible in (65) and in each case only the structurally accusative *Radha-* can be replaced by the reflexive *aapne-*.

(65) a. Ram-ne Radha-ko   mara
          Ram-erg Radha-dat/acc hit
      'Ram hit Radha'

  b. Radha-ko Ram-ne mara

And in Md. Eastern Armenian (G. Mardirussian, personal communication) both orders of full NPs preverbally are possible in (66) and in each case the reflexive pronoun *inkǝiran* may replace the accusative.

(66) Mard-ǝ erekh-i- n khangarav
      man -def child -acc-def disturbed
      'The man disturbed the child'

These examples are compatible with the NRC as the structurally nominative NP is basic. But where the reflexive precedes the nominative it cannot form a constituent with the verb. Within a GB approach various appeals could be made here to unobservable structure, but in my judgment they all weaken the explanatory appeal of the BT account. Why should conditions crucial to the interpretation of anaphors be allowed to be violated in the structures speakers observably use? The SCT + NRC approach yields the correct results without appeal to such structures.

(iii) Generalizing from the interpretation of *himself*, SCT permits a language independent definition of *anaphorically interpreted* ((76) below). This definition allows us to account for semantic generalizations in English which must be handled by independent mechanisms within the BT. It also enables us to lexically characterize certain differences in anaphora paradigms between languages and to overcome a methodo-

logical insufficiency in the BT approach. Namely, a theory of anaphora may not directly constrain the distribution of lexical items but only the availability of anaphoric interpretations of those items. For essential anaphors like St.Eng. *himself* the two coincide, but this is not the general case.

I first illustrate the problems and then give the definition of anaphor. Consider the anaphora paradigm in (67):

(67) a. Every student$_i$ loves his$_{ij}$ mother
     b. His$_{i,*j}$ mother loves everyone$_j$
     c. Himself$_{*i,*j}$ loves everyone$_j$

The NRC predicts the 'crossover' restrictions in (67b) (given the definition of anaphor). Thus the NRC blocks the anaphoric readings in (67b) and (67c) for the same reason. (The deictic reading (*i) of (67c), allowed in the languages discussed below, is independently blocked by the language particular (58)).

By contrast the BT does not predict the restriction in (67b). Independent mechanisms which tie the restriction to LF movement of *everyone* are invoked (see May 1985: 6). Thus the BT does not capture the interpretative similarity in (67b) and (67c).

Concerning lexically based anaphora paradigms and the methodological problem mentioned above, consider the following from Fijian, a [V + ACC + NOM] language.

(68) a. a   mokuti koya o ira kece
        past hit   3sg. pl. all
        'Everyone hit himself' or
        'Everyone hit him'
     b. a   mokuti jone o koya
        past hit   John 3sg.
        'He hit John'
        *'John hit himself'

In (68a) the structurally accusative *koya* may be interpreted either anaphorically or deictically (like *his mother* in (67a)). But when structurally nominative as in (68b) it is only interpretable deictically (like *his mother* in (67b)). Fijian lacks lexical essential anaphors – items which must be interpreted anaphorically, like St.Eng. *himself*. In this respect it is like other Oceanic languages such as Tongan, Samoan, Tahitian, Iai and Chamorro as well as N. Frisian, Middle English and Gilbertese cited in Keenan 1976).

The differences between Fijian and St.Eng. here are lexical, and should follow from the lexical specifications of *koya* and *himself*. But this is not

feasible within the BT as *koya* is not classifiable as an NP. It is not an anaphor since it may be free in a simple main clause; it is not a pronoun since it may be bound there, and it is not an r-expression since it may be bound.

What must be constrained in Fijian is the range of interpretations available to *koya* in transitive contexts. The word itself occurs freely there.

Comparable but more problematic anaphora paradigms are instantiated in Irish English, Japanese and Turkish below.

In Irish English (J. McCloskey, personal communication) the expressions *himself* and *herself* may be interpreted anaphorically as in St.Eng. But in addition these expressions may be interpreted deictically to mean 'the most prominent individual in context'. Thus an office worker might say to another who arrives late 'Careful. Himself is in a foul mood today' meaning 'The boss is in a foul mood today.' However, the availability of these two interpretations follows the pattern of Fijian above. In Ss like *Everyone respects himself* the structurally accusative *himself* may be interpreted either deictically or anaphorically (as SELF). But in Ss like (69) the structurally nominative occurrence of *herself* (the first one) may only be interpreted deictically.

(69) Herself is getting herself ready.

If the BT classed *herself* in Irish as an anaphor then (69) should be blocked for the same reason as (56b). If not, then the coreferential interpretation of the second occurrence of *herself* in (69) is predicted impossible. Both options are incorrect.

Note that in Irish English the deictic interpretation of (67b) is acceptable. Only the anaphoric interpretation is blocked. Comparable claims hold for Japanese and Turkish below.

In Japanese, as discussed in Sakaguchi (1985) (also in Kuroda 1965, Akatsuka 1976, Inoue 1976 and Sportiche 1986), the 'reflexive' *zibun* may be interpreted deictically as Speaker or Addressee according as the S is declarative or interrogative (imperative). (70c) is from N. Akatsuka (personal communication).

(70) a. Hanako-ga   zibun-o   utagatte-iru
        Hanako-nom   -acc doubts
        'Hanako doubts herself' or 'Hanako doubts Speaker'
     b. Zibun-ga   Hanako-o   utagatte-iru
          -nom Hanako-acc doubts
        'Speaker doubts Hanako' *'Hanako doubts herself'
     c. Zibun-wa zibun-o hazukasiku omotte orimasu
                        shamefully think   be (humble)
        'Speaker is ashamed of self'

(70a–b) exhibit the interpretative paradigm of Fijian (68) and (70c) presents the BT with the same problem as the Irish (69).

In Turkish (M. Enç 1983, 1987 and personal communication) the lexical item *kendisi* behaves like Fijian *koya* but in addition Turkish presents an essential anaphor *kendi*.

(71) a. Herkes-Ø   (ayna- da) kendisi-(n)i gördu
         everyone-nom mirror-loc   -acc saw
         'Everyone saw himself (in the mirror)' or
         'Everyone saw him/her (in the mirror)'
     b. Kendisi-Ø   (ayna-   da) kendisi-(n)i gördu
              -nom mirror-loc   -acc saw
         'He/she saw self (in the mirror)'

Replacing *kendisi* with *kendi* in (71b) we obtain only an anaphoric reading. (Note the absence of Principle B effects in (71b).)

As with Fijian, the Irish, Japanese and Turkish examples show that a theory of anaphora may not in general constrain the distribution of lexical items but only the range of interpretations available to these items.

4.2 Defining 'anaphor'

The definition I provide in (76) below is compatible with the intuition of 'referentially dependent' used in Chomsky 1986 and determines easily applicable tests of anaphoricity. To build the intuition behind the definition consider the interpretative differences between (72a–b):

(72) a. John kissed himself
     b. John kissed every student

We should like to find a test which shows that the interpretation of *himself* in (72a) is dependent on that of *John* in a way in which that of *every student* in (72b) is not.

To get at this difference observe first that if *John* is replaced by *Bill* in either S the resulting one may have a different truth value than the original. But suppose we know that Bill kissed exactly the same objects that John kissed. In that case the truth value of (72b) and of *Bill kissed every student* must be the same. But that is not sufficient to guarantee that *John kissed himself* and *Bill kissed himself* have the same truth value. If Bill kissed just Peter, John and Frank, and those are just the objects John kissed then *Bill kissed himself* is false and *John kissed himself* is true.

In other words, EVERY STUDENT cannot distinguish among individuals who kissed the same things. But SELF can. Thus whether EVERY STUDENT puts an object b in the set it associates with KISS does not depend on what object b is, it only depends on what objects b bears the KISS relation to. By contrast, whether SELF puts b in the set it associates

with KISS does depend on what object b is. In deciding whether to put b in the set, SELF must know both what objects b bears KISS to *and* that it is b that bears KISS to those objects.

These observations yield the following anaphoricity tests.

(73) *Accusative Extensions Condition* (AEC)
      To decide whether an NP X of arbitrary complexity is interpretable as an accusative extension of a basic function, verify that whenever John kissed exactly the same objects Bill hugged then *John kissed X* and *Bill hugged X* have the same truth value

(74) *Accusative Anaphor Condition* (AAC)
      To decide whether X as above is an accusative anaphor verify that it fails the AEC above but satisfies the following weaker condition: If John kissed exactly the same objects he (John) hugged then *John kissed X* and *John hugged X* have the same truth value

These tests are formally justified by theorem (75) and the definition in (76).

(75) *Thm* A function F from binary relations to properties is the accusative extension of a basic function iff for all binary relations R, S and all objects a, b
      if $R_a = S_b$ then $a \in F(R)$ iff $b \in F(S)$ $[R_a =_{df} \{x: aRx\}]$

(76) a. A function F from binary relations to properties is an *accusative anaphor* iff for all binary relations R, S and all objects b
          if $R_b = S_b$ then $b \in F(R)$ iff $b \in F(S)$
      b. F is a *proper accusative anaphor* iff it is an accusative anaphor and is not an accusative extension of a basic function

Corresponding to theorem (75) we have the nominative version obtained by replacing R_a with R^a and S_b by S^b (where R^a is by definition {x: xRa}). The same replacement in (76) yields the definition of *nominative anaphor*.

These definitions define properties of NP *interpretations*. They extend to NPs themselves as follows: An NP is said to be +*anaphor* iff it has occurences interpreted as proper (nominative or accusative) anaphors. An NP is called an *essential anaphor* if all occurrences are interpreted as proper anaphors. For example, Turkish *kendi*, St.Eng. *himself* and Korean *caki-casin* are essential anaphors. Fijian *koya*, Irish *himself* and Japanese *zibun* are not, but they are +*anaphor*.

4.3 *Consequences of the definition*

(i) We may now characterize the anaphora paradigms in the languages discussed in (68)–(71) by stipulating the interpretations of the relevant lexical items: Fijian *koya* is marked [+3(+deictic, +anaphor)] meaning it may be interpreted either deictically or anaphorically, third person in all cases. St.Eng. *himself*, Turkish *kendi* and Korean *caki-casin* are simply [+3 anaphor], whence all occurrences are interpreted anaphorically. Irish *himself* is [+3 anaphor, +male deictic: 'ranking individual in context']. And Japanese *zibun* is [+anaphor, +deictic: 'source of point of view of the utterance']. (For further features needed see Enç (1987).)

Any of the indicated interpretations of these items is available unless blocked by general constraints such as the NRC. The judgments in (68)–(71) follow.

(ii) The definition expands our concept of anaphor in English. For example, the structurally accusative NPs in (77) and (78) pass the test in (74).

(77) John criticized both himself and Paul / himself and no one else / everyone but himself / no one but himself / neither himself nor the other students who came late

(78) a. Each student tackled [a problem that
        i. no one but himself could solve]
        ii. only himself and the teacher could solve]
        iii. was chosen by a student other than himself]

Thus St.Eng. has denumerably many syntactically complex anaphors. In (78a.i) *a problem that no one but himself could solve* is + anaphor, indeed an essential anaphor. It properly contains another complex anaphor, *no one but himself*, which in turn properly contains a lexical essential anaphor. A detailed investigation of these anaphors remains to be done. They have some properties in common with the 'pictures of each other' cases discussed in Chomsky 1986: 174ff in that they are long distance, and replacing the lexical anaphor *himself* by *he/him* does not force judgments of disjoint reference. But they also differ:

(79) a. *John thought that Mary criticized himself
      b. John thought that Mary criticized everyone but himself
      c. Each student thought that Mary would ask a question that
          i. no one but himself could answer
          ii. only himself and Paul could answer
          iii. *himself could answer

Thus only the lexical anaphor *himself* must be bound to the closest available subject. The complex anaphors then are similar to the lexical

long distance ones in Japanese (Akatsuka 1976: 53) and Kannada (Bhat 1978: 56).

These data suggest a reevaluation of long distance anaphora in English. Namely, in general it is possible, but subject to a lexical exhaustion constraint, perhaps one similar to that on across the board Pied Piping shown in (80).

(80) a. every man whose mother and whose father John knows
      b. *every man who and whose father John knows

(iii) An important feature of our definition is that + anaphor NPs are, like basic NPs, directly interpreted. For example, EVERYONE BUT HIMSELF is that function sending each binary relation R to {b: $R_b = D - \{b\}$}. Thus our approach enables us to exhibit properties that anaphors and basic NPs have in common – they may both take binary relations as arguments satisfying the accusative anaphor condition in (76). It is thus unsurprising on this view that NP anaphors *are* NPs and may coordinate with them, as in *John criticized himself and everyone else*.

By contrast BT approaches give little or no account of what NP anaphors have in common with basic NPs. On views which, in effect, translate them as bound variables they appear completely different from quantified NPs which are variable binding operators. Even on the revisions of BT suggested in Chomsky (1986: 175) it is unnatural to expect that reflexives and quantified NPs may form complex NPs like *everyone but himself* or *himself and everyone else*.

5 Conclusions, Extensions and Speculations

Very many difficult issues concerning both scope assignment and anaphora possibilities have been simply excluded from consideration here in virtue of limiting ourselves to transitive contexts. The adequacy of an SCT-based approach to these questions then will depend on how successfully the NRC and the definitions of semantic case and +anaphor can be extended to more complex contexts. Preliminary work here is encouraging:

Wh-questions and crossover

In intransitive contexts we may think of interrogative NPs such as *who*, *which student, whose cat and whose dog* as functions from properties to question denotations. Their interpretations in transitive contexts are just the isomorphic images of the case extensions of non-interrogative NPs. In Ls such as Chinese (Huang 1982) in which transitive declaratives and interrogatives are syntactically isomorphic then the crossover judgments

in Qs like *His doctor examined who*? follow in the same way they do for quantified NP accusatives in English, as in (67b).

Reciprocals

We have limited our considerations here to 'first order' predicates, ones expressing properties of or relations between individuals (rather than sets of individuals). Reciprocals form higher order predicates. For example, *love each other* expresses a property that a group of individuals might have, but doesn't make sense when predicated of a single individual. Modulo this difference in logical order, our anaphora tests apply in a natural way to reciprocals. To check that *each other* is a higher order anaphor verify that (81a) and (81b) have the same truth value whenever each element of the subject set {John, Bill} kissed exactly the same objects he hugged.

(81) a. John and Bill kissed each other
      b. John and Bill hugged each other

Acquisition of anaphors

The axioms of SCT are clearly deficient in one respect: Case Existence only applies to closed (= basic) NPs. Nothing explicit is said about the interpretation of initially open (= deictic) NPs in transitive contexts, though one limiting result does follow: If an initial NP is interpreted anaphorically in a transitive context then it is interpreted deictically in the intransitive context.

Conceptually this link between anaphoric and deictic interpretations is principled. What we have been calling initial deictics are just initial NPs whose interpretations depend on information not given by the NP itself. By the assumptions on the linguistic context the dependency must be extralinguistic. But in transitive contexts this need not be the case. Expressions external to the NP in question may provide the information on which the open interpretation depends.

Thus the distinction between anaphoric and extralinguistic deictic is created by the context the transitive verb determines and we are justified in considering anaphoric interpretations of initially open NPs as special cases of open interpretations.

Thus the Fijian child who interprets *koya* 'he, him' anaphorically in transitive contexts is just applying the knowledge already obtained in learning that *koya* in intransitive contexts is open.

What requires special learning on this view are the essential anaphors (St.Eng. *himself*). Their interpretations cannot be projected from initial contexts as they do not occur there and cannot be interpreted anaphorically there. Thus the St.Eng.-speaking child is faced with a learning task not faced by Fijian (M. English, N. Frisian, . . .) speakers.

Interestingly this view of anaphora receives experimental support by Wexler and Chien (1985). They tested St.Eng.-speaking children from ages 2.6 to 6.6 on their ability to correctly identify possible antecedents of essential anaphors and pronouns (*him*, *her*). They found that throughout this period, with little improvement, the children often interpreted the pronouns with local subjects as antecedents, in violation of Principle B. That is, they were behaving like little Fijian speakers. By contrast, performance on reflexives started off poorly and consistently improved achieving about 90 percent correct responses at age 6.6.

Both these results confirm the view presented here. Initial deictics were interpreted anaphorically, and the learning of essential anaphors was a significant learning task.

Consequences for UG

If the approach taken here can be refined and extended to something like the range of data considered within the Binding Theory (a forbidding task!) this will have some challenging implications for our conception of UG (= our innate, linguistic endowment).

For example, we have shown, for the limited class of structure types considered, that the interpretation of quantified NPs and the representation of quantifier scope ambiguities does not *require* a level of LF.

More seriously the work here calls into question the UG status of that part of the BT covered by SCT + NRC. The anaphora facts we accounted for relied on the NRC and the axioms of SCT, mainly Case Existence. But these are naturally understood as special cases of a very general ability to generalize. Case Existence says we generalize the interpretation of basic NPs from initial contexts to more complex ones, and the NRC says we generalize the interpretative possibilities of initial NPs to structurally nominative ones. The ability to generalize from simple cases to more complex ones does not seem to be specifically linguistic.

But we should note in this regard that the status of the NRC is far from established. Generalizing it to more complex contexts will require revisions. And it lacks the intuitive appeal of the axioms of SCT. To be sure it guarantees an 'anchor' for anaphors but so would generalizing the referential possibilities of initial NPs to structural accusatives. I have as yet seen no clear examples of such anaphorically ergative languages. If there are none, or only few, what would explain that? Why generalize here at all? If either NP in a transitive S could be an anaphor its antecedent would have to be the other. Indeed if the analysis of Samoan given by Chapin (1970: 369) extends to anaphorically interpreted items with quantified NP antecedents we will have a counterexample to the NRC. So the NRC may be just one among many options which languages may choose to restrict the interpretations of NPs in complex contexts.

Notes

1 I take Binding Theory in the following weak form (where *bound* means coindexed with a C-commanding NP and *free* = not bound):

Principle A: Anaphors are bound in some domain   D-ana
Principle B: Pronouns are free in some domain   D-pron
Principle C: r-expressions are free

Following Chomsky (1986: 171) D-ana may be different from D-pron. I assume they both include main clause transitive Ss.

2 Formally, for each b in D define the basic function I_b, called the *individual generated by* b, as that function which sends a property p to True iff b is in p. A basic function F is an individual iff $F = I_b$ for some object b. Proper nouns are constrained to denote individuals. It is easily seen that given an individual there is exactly one object b which generates it. These are the 'John objects' referred to later.

3 I ignore here for simplicity the possibility that the initial NPs may referentially depend on the P_1. It is hard to find such cases with simple P_1s. Possibly the *it* in *It is raining*. More interesting cases arise as the predicate becomes more complex: In (i) the reference of *they* seems to be something like 'whoever is in charge of raising taxes'. In (ii) it seems to be 'the Chinese'.

(i)   They're raising taxes again
(ii) They eat a lot of rice in China

Cases of 'arbitrary reference' can probably be subsumed under the class of closed interpretations but have a clear interest in the present context: namely, they constitute another possible interpretation for 'reflexives' in particular in environments where they are not bound. See Rappoport (1986) for such uses in Russian.

4 Observe that closed interpretations may be represented as the special case of open ones which are constant. Further work will possibly yield multiple 'indices' on which interpretations may depend, in which case openness will be a gradable property.

5 Often written (b KISS d). The notation is misleading as it suggests, irrelevantly, that the first member of the pair (b, d) is somehow attached to the first NP in a transitive S.

6 An NP occurrence is *independent* in E iff it is not a proper constituent of any other NP occurrence in E. The independent NP occurrences in (in)transitive Ss correspond to 'arguments' in GB approaches, but here no primitive notion of argument is assumed.

7 I ignore here the binary quantifiers explored in Keenan 1987b. It is shown there that, limiting ourselves to first order properties, in Ss like *Every student answered a different question* the NP *a different question* cannot be interpreted as a function from binary relations to properties at all. Rather, the pair (*every student*, *a different question*) directly determines a function from binary relations to ~~properties.~~ *truth values*

8 More precisely: There is no basic function F such that for all binary relations R, $F_{acc}(R) = SELF(R)$. Ditto for F_{nom}.

9 Thanks to Fritz Hamm for discussion of this axiom.

10 Thanks to Leonard Faltz for discussion of this axiom.

11 Following current practice I ignore the fact that in main clause Ss one of the NPs would have its postposition replaced with the topic marker *-wa*. Since *-wa*, *-ga* and *-o* are distinct it is clear that the JCC in (25) could be stated directly on forms using *-wa*. However, the statement is more complex and the one given does not make it clear that the correct statement will have to mention the identity of the transitive verb. Comparable remarks obtain for Korean with its topic marker *-(n)ŭn*.

12 In what follows I largely ignore questions of scope interpretation, mainly because the facts of interest relate to argument ambiguities but also in part for lack of data. Noteworthy though is that of the several languages where I have data only Chinese appears to block scope ambiguities in basic transitive Ss. Moreover, the detailed experimental work of T. Lee (1986) shows that even by the age of eight Chinese-speaking children still exhibit a very significant tendency to get two scope readings, having only about 60 percent adult competence in this respect.

13 Statements of CCs will of course be more complex when three-place predicates are considered. In addition the CCs I give are often only partial in the sense of not covering all syntactic types of BatSs. Still the class I do cover is large and includes the common S types adduced for the languages in the literature.

14 Guerssel's analysis raises several interesting issues, but it still preserves the distinction between +/− construct state, though in a different form.

15 Note the ethnocentric bias in the question. Had we begun our linguistic analyses on the basis of Berber and Middle Egyptian we might well now be explaining why the nominative NP in English wasn't bound to the verb.

16 For example: the feminine ending on nouns in M.E. is *-t*, in B. it is *t-...-t*; the passive affix on verbs in M.E. is *-tw*, in B. it is *ttw* (tensed *t*); the causative prefix on verbs in M.E. is *s-*, in B. it is *ss-*. Even the preposition *n* 'of' is the same in the two Ls, but it has a more widespread use in M.E. where it attaches verb bases to the 'subject' agreements. It also occurs as an independent preposition outside of genitive constructions.

17 This is a well definition by the Case Structure axiom. Note that no notion of a 'position' which exists independently of an NP that fills it is invoked. Such a notion is moot in free word order languages.

18 Hale (1983) citing unpublished work of Whitman claims that Japanese does not follow the Korean (Hindi, Armenian, Kannada) paradigm.

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CHAPTER 6

Concessive Connectives and Concessive Sentences: Cross-Linguistic Regularities and Pragmatic Principles

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1 Introduction

Together with terms like 'conditional', 'temporal', 'causal', etc., the term 'concessive' belongs to the terminological inventory that traditional grammar makes available for the characterization and classification of adverbials and adverbial clauses. Any attempt to give a cross-linguistic characterization of concessive relations and the way they are expressed in the world's languages is constrained by the fact that we do not have enough relevant information from a representative sample of languages. This situation could be due to several factors: First, there may simply not be any concessive markers in a language other than the adversative conjunction corresponding to English *but*. An elaborate inventory of concessive expressions, as found in European languages, presupposes, it seems, a certain tradition of argumentative writing. Second, available reference grammars may simply fail to provide the relevant information. Concessive relations have always aroused less interest than conditional or causal ones in both theoretical and descriptive studies, since the latter play a much more important role in scientific argument. And third, the formal means available in a language for expressing concessive relations may be more or less identical to those used for other functions without explicit mention being made of this fact in the relevant grammar.

   The subsequent discussion, though based on a sample of seventy languages,[1] will therefore exhibit a certain bias towards European languages as well as those languages on which detailed information in the relevant area happens to be available. The cross-linguistic generalizations that will be made below relate primarily to the formal make-up of concessive connectives, the affinity to other notional domains that this make-up suggests and the historical origins of these connectives. The 'explanations' that will be offered are basically pragmatic ones.